

the 17th, and rain warnings were issued the morning of the 23d for the heavy rain which fell generally in California on the 24th and 25th.

The following letter refers to a special long-range forecast for Lynchburg, Va., made upon the request of Mr. Withers P. Clark, of the Lynchburg Fair Association:

On behalf of the Lynchburg Fair Association, I wish to express to you our appreciation for the four days forecast furnished by you, at our request, just previous to our recent fair and carnival. In calculating the relative chances of success, the matter of weather entered as a most important factor, and the very accurate information we obtained through your kindness was valuable, indeed, and we thank you for it.

BOSTON FORECAST DISTRICT.

The month was uneventful. The first killing frost of the season in the cranberry regions, which are chiefly confined to the coast sections of Massachusetts, was correctly forecast. This is the only portion of the district where frost warnings are of special importance or value.—*J. W. Smith, Forecast Official.*

NEW ORLEANS FORECAST DISTRICT.

The only storm of the month on the Gulf coast occurred at Galveston on the 8th. The official in charge at that station hoisted warnings in ample season. Timely warnings were issued twenty-four hours in advance of the general frost which occurred over the northeastern portion of this district on the morning of the 14th.—*I. M. Cline, Forecast Official.*

CHICAGO FORECAST DISTRICT.

The month was notably free from disastrous storms and dangerous winds. The only notable storm of the month crossed the upper lakes during the 12th and 13th, and storm warnings were displayed in advance of it.—*F. J. Walz, Forecast Official.*

DENVER FORECAST DISTRICT.

No special warnings were issued during October, 1901.—*F. H. Brandenburg, Forecast Official.*

SAN FRANCISCO FORECAST DISTRICT.

The month, as a whole, was a dry one; between the 4th and 24th but little rain fell. A heated spell occurred from the 10th to the 12th, the 11th being the warmest day of the year to date; the maximum reached 91.4° at San Francisco on the 12th. The rains of the 17th in the San Joaquin Valley and of the 24th and 25th generally over California were accurately forecast on the 16th and 23d, respectively.—*A. G. McAdie, Professor.*

PORTLAND, OREG., FORECAST DISTRICT.

The month was unusually warm and dry. No damaging frosts occurred west of the Cascade Mountains, but freezing temperatures and frosts were of frequent occurrence east of this range. The closing days of the month on the Washington coast were stormy, and reports obtained from incoming Alaska steamers were to the effect that the gales were unusually severe off the Alaska and British Columbia coasts. Marine interests were kept fully advised regarding the force and character of the storms, and no casualties of consequence occurred.—*Edward A. Beals, Forecast Official.*

HAVANA, CUBA, FORECAST DISTRICT.

Several disturbances of minor importance appeared in the West Indies during the month, concerning which marine interests were fully advised.—*William B. Stockman, Forecast Official.*

AREAS OF HIGH AND LOW PRESSURE.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
High areas.										
I.....	1, a. m.	50	120	2, a. m.	41	101	1,250	1.0	1,250	52.1
II.....	2, a. m.	51	114	7, p. m.	39	75	3,075	5.5	559	23.3
III.....	4, p. m.	54	106	11, a. m.	48	54	1,825	3.0	608	25.3
IV.....	9, a. m.	49	86	16, a. m.	39	80	1,475	2.0	738	30.8
V.....	12, a. m.	50	120	19, a. m.	34	78	2,900	4.0	725	30.2
VI.....	14, a. m.	51	114	20, p. m.	44	73	3,150	5.0	630	26.2
VII.....	18, a. m.	51	117	26, a. m.	34	78	2,200	2.5	880	36.7
VIII.....	23, p. m.	53	108	29, a. m.	45	67	2,150	3.5	614	25.6
IX.....	24, a. m.	38	114	29, a. m.	45	67	2,625	5.0	525	21.9
	25, p. m.	53	106	14, a. m.	47	65	2,225	3.5	636	26.5
	30, a. m.	43	123				3,350	5.0	670	27.9
Sums.....							26,225	40.0	7,835	326.5
Mean of 11 paths.....							2,384		712	29.7
Mean of 40.0 days.....									656	27.3
Low areas.										
I.....	*30, a. m.	41	105	4, a. m.	45	64	2,325	5.0	465	19.4
II.....	3, p. m.	50	110	6, a. m.	44	70	1,950	2.5	780	32.5
III.....	5, p. m.	38	105	9, p. m.	49	86	1,550	3.0	517	21.5
IV.....	8, a. m.	50	107	12, a. m.	49	90	1,350	1.5	900	37.5
	10, a. m.	38	100	18, a. m.	47	85	1,050	2.0	525	21.9
	10, p. m.	51	114	18, a. m.	48	54	1,175	1.5	783	32.6
V.....	11, a. m.	26	97	18, a. m.	47	85	1,775	2.0	888	37.0
VI.....	13, a. m.	54	114	16, a. m.	48	54	3,175	5.0	635	26.5
VII.....	16, p. m.	40	80	19, a. m.	48	54	3,575	6.0	646	26.9
VIII.....	16, p. m.	54	114	20, a. m.	46	60	1,525	2.5	610	25.4
IX.....	23, p. m.	54	114	27, a. m.	47	65	2,350	3.5	671	28.0
X.....	26, a. m.	38	123	28, p. m.	53	105	1,725	2.5	690	28.7
	29, a. m.	54	114	11, a. m.	48	69	2,100	3.0	700	29.2
Sums.....							28,500	43.5	9,546	397.8
Mean of 14 paths.....							2,036		682	28.4
Mean of 43.5 days.....									655	27.3

*September. †November.

For graphic presentation of the movements of these highs and lows see Charts I and II.—*H. C. Frankenfield, Forecast Official.*

RIVERS AND FLOODS.

Nothing of interest occurred along the various river systems during the month of October. Stages were generally lower, except in the upper Mississippi. During the last few days of the month the stage of the Ohio River was so low that boats could not proceed above Maysville, Ky. On the upper Tennessee navigation for the larger boats was suspended on the 24th.

No ice has as yet appeared in the rivers.

The highest and lowest water, mean stage, and monthly range at 134 river stations are given in Table VII. Hydrographs for typical points on seven principal rivers are shown on Chart V. The stations selected for charting are: Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport on the Red.—*H. C. Frankenfield, Forecast Official.*